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Effect of Teaching with Flipped Class-room Model: A Meta Analysis

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The flipped classroom model has been used by a number of the teachers for active learning and better understanding of the students. In this approach, the students learn the video-based subject content prior to in-class session and participate in collaborative learning activities during the class. The class time is utilized for activities, games and discussion. This model is increasingly used for teaching and learning purpose in developed countries where technology is highly integrated in education. This article is meta-analysis of already conducted experimental studies to highlights the academic, social and emotional development of students during experiments. The reviewed articles were searched on 4 data bases and 12 journal articles, based on experimentation. These articles contained a variety of the subjects taught to students from primary level to Higher education. The results suggested that students in flipped classroom were more active, engaged, motivated, and interactive and academically they were better performer. It is concluded that flipped classroom model increases academic achievement and improve social and emotional development of students. However there are some limitations of the flipped classroom model as students are not aware of self-learning/autonomous learning. Teachers need training for material selection, development, and presentation in videos. The review of qualitative researches would explore more benefits of flipped class rooms on learning, behavior, attitude and personality of the students.

Keywords*:* flipped classroom, academic achievement, collaborative learning, engagement,

Blended learning pedagogy becomes popular in many institutions. Flipped classroom (FC) is one of it. It is the most innovative and emphasized teaching strategy in recent years. Many teachers/researchers used flipped classroom approach to teach their students. Their findings showed it is an effective approach. Basically Flipped classroom idea traced in 2000. When a

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university professor found his students copy information without understanding (Baker, 2000).The flipped classroom is a reverse model of teaching. Itis comprised of two phases. In the first phase, the learning content is provided to students prior to class meetings which include online videos, reading material, screen casts or podcasts. In the second phase, different activities are performed and valuable class time is utilized for more collaborative and engaging activities. It could be defined as students get low-level learning (lecture, passive) outside the class and high-level learning(active, practice) within the class (Sarawagi, 2013).

Different researchers used flipped classroom model as it reduce the time of passive listening and to increase the time of active learning. This approach is useful especially for subjects that demand concept clarity and practice. Students have enough time for practice in class in supervision of the teacher. Students utilize class time in hands-on activities, games and discussion (Lage & Platt, 2000).Content is delivered to students via internet, which consists of videos or reading material. These videos have replaced the post-lecture assignments and offered classroom time for more differentiated education (Davies, Dean & Ball, 2013).This model gives equal weight-age to theory and practice which affects the academic, social and emotional development of the students. It is technology-driven teaching methods because technology is a major component as pre-class reading material and videos are shared via technology (Davies et al., 2013; Graziano, 2016).

Flipped pedagogy has brought change in the role and mindset of the teacher (Siegle, 2014). Their role of course designer has shifted to resource provider, activities' planner, facilitator of knowledge and evaluator of student learning. He guides students to think and discuss, and also gives advice and feedback. He develops self-learning habit in students that leads to discussion, communication and problem-solving ability (Hwang, 2015). Teachers explore different tools to meet the needs of individual students and think less about the method. The shift of the content out of the classroom has given more time to teachers for making activities (Hamdan, McKnight, McKnight & Arfstrom, 2013).

All the students are different from each other and they also have different learning styles. This is the reason that students in the same class, by studying the same subject from the same teacher, varies in their level of learning. But flipped pedagogy provides personalized learning opportunity to students. They can move on learning with their own pace. Teacher blends direct instruction with different learning activities (Davies et al., 2013), in this way the teachers facilitates learning of various students. Activities engage all the students in class and never

get them bored in class time. They actively participate in class discussion as they cover content prior to class (Davies et al., 2013). In flipped class room approach, students develop individual strategies of finding, evaluating and using information (Wakefield & Smith, 2012). Keeping in view all above discussion this study has been designed to analyze already conducted experimental research studies used flipped classroom approach as pedagogy. The conceptual frame work for the review of flipped classroom researches was taken from Cabi (2018) it is based on three categories i.e. Academic, Social and emotional development.

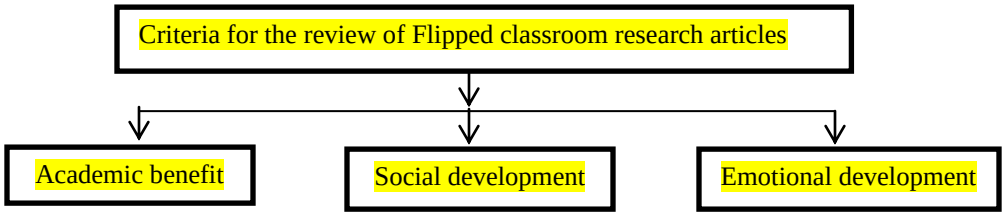

Figure 1: Conceptual framework for the review of conducted researches

Objective of the study

Different research studies conducted at different educational levels all over the world. The objective of this article is to analyze the research studies already conducted during 2013 to 2018 i.e. 5 years. The prime objective was to investigate which type of academic, social and emotional development was evidenced when using flipped classroom approach.

Research Questions

The following are the questions that guided the present study:

1. What is the effect of flipped classroom on the academic achievement of students?
2. What is the effect of flipped classroom activities on social development of students?
3. What is the effect of flipped classroom activities on emotional development of students?

Method

Data Sources and Searches

The present review was carried out according to the guidelines of PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analysis). Online databases were used for articles, relevant to the study. In October 2018, 4 data bases were searched for this purpose which included as: (1) JSTOR, (2) Taylor and Frances (3)ERIC (Education Resources Information Center) and(4) Springer.

The search phrase was "(flip*OR invert*)AND (class*OR model* OR instruction*)". Some related phrases which are used for flip were also tried out like flipped learning and invert class room.

Research Study Selection Criteria

Criteria used for the selection of articles for review was, publishing time, type of methodology, type of publication & language. The detail of inclusion and exclusion criteria of articles is given in the following table.

Table 1

Selection Criteria for Articles

Criteria	Inclusion	Exclusion
Time period	2013-2018 (5 years)	The studies that do not lie in the range of selected years
Type of the study	Experimental studies, Action research, Mixed method	Qualitative studies
Type of article	Empirical studies published in Peer reviewed journals	Non-empirical studies
Language	English	Non-English studies

The table1 shows selection criteria for the articles which were published during 2013 -2018. These selected studies used experimental design, action research and mixed method. They have evidence for the difference in the academic achievement of learners when used flipped class and those who studied in traditional way. Besides that, the empirical studies, written in English language and published in peer-reviewed journals, were included for review. There was no restriction on grade or levels of education, subjects or fields of study and geographical location of experimentation.

The research presented here was limited to time, research design and language of the published articles. In fact the exclusion criteria show the limitation of the study. Firstly, due to shortage of time the study was limited to quantitative and mixed research design, by leaving qualitative approach of research which could provide more information regarding activities and benefits of flipped model. Secondly, due to time restrain, a limited sample of publish articles in between 2013-2018 were selected. Finally, due to researcher's inability in understanding the foreign languages other than English, many articles were skipped from review.

Data Extraction

The researcher found total 313 journal articles. 96 articles were found replication on databases so was removed. By using other data sources 21

additional articles were identified. After reading the title and abstract of the articles, 226 articles were removed because they did not meet the criteria, set for review. This criterion reduced the threat to researcher's biasness in selection. Then the eligibility of 12 full-text articles was assessed and finally they were selected for review.

The whole process of data extraction is shown through the following:

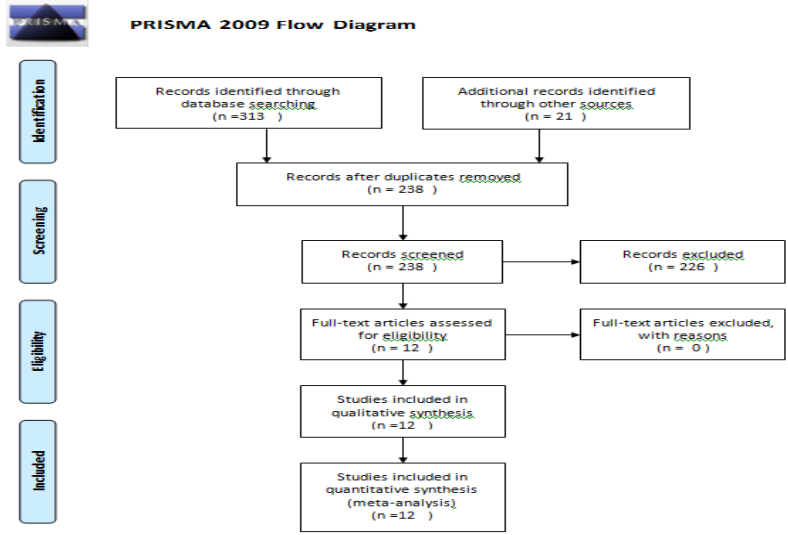

Figure 2: Source: http://prismastatement.org/PRISMAStatement/FlowDiagram.aspx

Data analysis

Selection Criteria for the articles

This section addresses three research questions. The first is about students' achievement in flipped class room, second is social and third is emotional development of students when using flipped classroom model during teaching. Keeping in view these three questions, the related information was saved in separate folder and then they were arranged in tabulated form. 12 articles were scanned thoroughly. The detail of the scanned articles is given in table.

Table 2

Overview of 12 Selected Review Articles

Study	Country of Origin	Subject	Sample		Grade Level & Age	Study Design	Duration of Intervention
			Flipped	Traditional			
Bhagat, Chang & Chang(2016)	Taiwan	Math	41	41	High School (14-15 Years)	Quasi-experimental	6 Weeks
Clark (2015)	USA	Math	42	Not mentioned	Grade 9 (13-15 Years)	Action Research	7 Weeks
Gonza´lez-Go´mez, Jeong, Rodrı´guez & Can˜ada-Can˜ada (2016)	Spain	General Science	52	51	Second year Graduates	Quasi-experimental	1 Semester
Huang & Hong (2016)	Taiwan	English	40	37	Grade 10	Mixed method	12 Weeks
Kostaris, Sergis, Sampson, Giannakos & Pelliccione (2017)	Not mentioned	ICT	23	23	K-12	Action Research	8 Weeks
Kurt (2017)	Turkey	Classroom Management	32	30	Prospective teachers (19-21 years)	Mixed Method	14 Weeks
Leo& Puzio (2016)	USA	Biology	2 Sections	2 Sections	Grade 9	Quasi - experiential design	Not Specified
Olakanmi (2016)	Nigeria	Chemistry	33	33	Secondary School (13-14 years)	Mixed Method	3 weeks
Sahin, Cavlazogl& Zeytuncu (2015)	USA	Math	3 Sections	7 Sections	Higher Secondary	Quasi Experiment	1Semester
Schwarzenberg, Navon, Nussbaum, Pe´rez-Sanagusti´n & Caballero (2018)	Chile	The Introductory Programming Course	(151)3 sections	(226) 4 sections	University level	Quasi Experiment	2 Semesters
Wang, An, & Wright(2018)	China	Chinese Language	31	30	1st Year Graduate	Mixed Method	16 weeks

Zack, Fuselier, Gram-Squire, Lamb& O'Hara (2015)	USA	Math, pre-calculus, Business calculus, calculus 1	4 sections were taught via flip and traditional way of teaching	1st Year Graduate	Mixed Method	1 Semester

The table 2 shows that most of the studies were conducted in USA (n = 4) and other were conducted in Taiwan (n=2), Spain (n= 1), Nigeria (n= 1), China (n= 1), Chile (n= 1) and Turkey (n= 1) but the origin of one of the study was not identified as it was not mentioned in the study.

The courses which taught in flipped classes were: Math (4), ICT (1), Chemistry (1), Biology (1), English (1), General Science (1), The Introductory Programming Course (1), Classroom Management Coursein Teacher Education Program (1) and Chinese Language(1).

The studies were conducted at different levels, from Primary to Graduate level, that's why participants also varied in their ages. The sample of flipped class-rooms was comprised of single section to 4 sectionsof the students to receive the treatment.

Most of the studies were Quasi-experimental (5) and Mixed method (5). Two of the studies implied Action Research design.In all the studies, treatment was given to experimental group and different methods of assessment were used to see the difference between the performance of experimental and controlled groupparticipants.

Duration of the intervention of studies ranged from 3 weeks to 16 weeks.

Activities performed in Flipped Class rooms during experiments

As Flipped class room model has two phases, so different activities for pre-class and in-class were planned and executed by different practitioners in the studies. Four of the studies also mentioned post-class activities. The detail of the activities is given in the table.

Table 3

Activities of Flipped Class-room Model

Study	Flipped Class-room Activities		
	Pre-Class	**During Class**	**Post Class**
Bhagat et al. (2016)	Short videos (15-20 min)	Discussion	
Clark (2015)	Reading articles, videos, viewing presentation, podcasts,	Independent practice, activities, discovery learning, group work, project-based learning,	
Gonza´lez-Go´mez et al.(2016)	Videos, Reading material, online quizzes	Just-in-time lecture, small group discussion, case studies,	Submitting a report of accomplished tasks
Huang & Hong (2016)	Video	Group work, warm up discussion, students' questioning	
Kostariset al. (	Videos, online lectures	Jigsaw technique,	Evaluating

2017)		Web-quests, project based activities	project
Kurt (2017)	Instructor-generated podcast (40-45 minutes), reading book material, quiz	Role play, problem solving, watching and commenting on real classroom videos., analyzing case scenarios	
Leo& Puzio (2016)	Video lectures, short quiz to Moodle (Modular Object-Oriented Dynamic Learning Environment)	Laboratories, projects, Interactive forms of learning.	
Olakanmi (2016)	Sharing video link or on flash drive/ DVDs(Digital Video Disc) for those having no internet facility, reading material with quiz	Hands-on activities, participated in real-world applications,independent practice	
Sahinet al. (2015)	10 min video with introduction to lecture	Survey and pop quiz	
Schwarzenberget al. (2018)	Lecture Videos with worked examples, Forum participation, Closed-ended quizzes	Group programming assignments, Question/Answer sessions, Concept reviews, Worked examples	Laboratory (each week), programming milestones, Three graded programming assignments,
Wang et al. (2018)	Modules on MOOC(Massive Open Online Course)consisted reading material, videos, auto grading exercises, discussion forum	Quiz, language practice and pair/group activities, role play,	Completing next module available on MOOC for next class
Zacket al. (2015)	Lecture videos, short assignment	Question/Answer, working on online assignment, quiz, activities	

The table 3 shows the variation of pre-class activities. The short videos or lecture video were shared with students .The other pre-class activities were providing articles/ material for reading, podcasts, online lectures, quizzes, sharing video link or on flash drive/ DVDs for those having no internet facility, short assignment, short quiz to Moodle and providing modules on MOOC. Technology was used for all these activities.

The in- class activities were discussion , independent learning practice, different activities, discovery learning, group work, project-based learning, Just-in-time lecture, case studies, the Jigsaw technique, Web-quests, Question/Answer sessions, project based activities, lecture, pop quiz, survey, role play Concept reviews, language practice and short assignment.

The post class activities consisted on evaluating project, submitting a report of accomplished tasks, assignments, Laboratory work and completing next module available on MOOC for next class.

Effect of Flipped Classroom Model on Students' Achievement

Students in all the studies were divided into two groups. One of the groups was taught through activities in flipped class room model and other in traditional way. The performance of the students was assessed through test. The details are given in the table:

Table 4

Achievement Scores of Flipped and Traditional Class

Study	Tool used for measurement	Flipped Class	Traditional Class	Result
		Mean scores	Mean scores	
Bhagat et al., (2016)	Pre-test Post test	5.25 9.18	5.75 7.62	Significant difference in scores of low achiever
Clark (2015)	Post test	80.38	80	No significant difference
Gonza´lez-Go´mez et al.,(2016)	Post test (Nunber of students who passed exam)	35	29	Significant difference
Huang & Hong (2016)	Pre-test Post test	30.69 41.17		Significant differences
Kostaris et al., (2017)	3Assessment scores	16.8 18.3 18.1	15.7 15.7 16.9	Significant difference
Kurt (2017)	Post test	73.38	58.80	Significant difference
Leo& Puzio (2016)	ANCOVA(Analysis of Covariance)			Significant difference
Olakanmi (2016)	Pre-test Post test	5.12 10.82	5.73 7.14	Significant difference
Sahinet al., (2015)	Post test	8.32	7.54	Significant difference
Schwarzenberg et al..(2018)	Multiple Regression (final exam score)			Significant difference
Wangel al., (2018)	Post test	16.26	14.63	Significant difference
Zacket al.,(2015)	ANOVA (Analysis of Variance)			No significant difference

Table 4 shows that in 3 studies, pre-test and post tests were conducted from both the groups and then their performance was assessed, whereas post-test was conducted in 5 studies. In one of the study, students' performance was

assessed continuously at different levels. ANOVA, Multiple Regression and ANCOVA tests were also applied to view the impact of treatment on experimental group.

There was significant difference in the scores of the experimental group and control group (Gonza´lez-Go´mez et al., 2016; Huang & Hong,2016; Kostaris et al., 2017; Kurt , 2017; Leo& Puzio, 2016; Olakanmi, 2017; Sahin et al., 2015; Schwarzen et al., 2018; Wang et al., 2018). This difference was observed in 9studies. In one study, significant difference was observed only in the scores of low achievers (Bhagat et al., (2016), but no significant difference was observed in the scores of the experimental group and control group in 2 studies (Clark, 2015; Zack et al., 2015).

Activities performed during Flipped Classroom experiment

The review of selected research articles showed following tools/techniques and actives were performed during flipped classroom experiment for students' social and emotional development, such as focus group, interview, teacher notes, observation and survey. Detail is as follows:

Table 5

Source for Identifying Benefits of Flipped Class

Study	Source
Clark (2015)	• Focus group, • Interview • Teacher notes
Gonza´lez-Go´mez et al.(2016)	• Survey
Huang & Hong (2016)	• Interview • Observation
Kostaris et al., (2017)	• Survey • Teacher journal
Leo& Puzio (2016)	• Informal qualitative data- before, during and after class
Olakanmi(2016)	• Classroom observations • Interview
Zack et al., (2015)	• Survey

Effect of flipped classroom activities on social development of students

It was noticed during review of the selected articles that different activities effected students' social development during experiment. The detail is as follows:

Communication

Student in flipped class room get more opportunities to communicate with their teachers. There is student-to-teacher and student-to-student communication as in class they discuss their problems with other students, share solutions and also validate their thought process (Clark, 2015).

Student Engagement in Class

Engagement is an active involvement of students in a learning activity, and it is a strong forecaster behind the learning, academic progress and achievement of the students. Students in flipped class room model are engaged mentally, physically and emotionally. They are engaged throughout the course (Kostaris et al., 2017). Participation and communication of students in flipped class room model, promote a student-centered classroom environment which is helpful for learning and success of the students. Students prefer flipped classroom being actively engaged in the lesson rather sitting passively and listening to a lecture (Kurt, 2015).

Student Teacher Interaction

Flipped class room model is helpful in developing students' interaction with teacher, it results in making conducive environment for effective learning (Zack et al., 2015). Students interact with their teacher through warm-up questioning, class meeting, small group work or performing activities (Huang & Hong, 2016).

Many times, in the traditional classroom, the needs and confusion of an individual is not noticed by a teacher, but in the flipped classroom, the teacher speaks to every student and addresses their concern and also ask questions about the current topic, which helps in clarity of the concept (Clark, 2015).

Videos: An Easy Mode of Learning

It is easier for students to watch 10 minutes video rather than reading the textbook. Videos develop the interest of the students whereas the lengthy paragraphs make them get bored (Sahin et al., 2015; Kurt, 2015). These videos engage students more with course content (Gonza´lez-Go´mez et al., 2016). Videos have the option of stop and rewind so students can pause them while taking notes from these videos (Zack et al., 2015). Students appreciate watching the lectures at their convenient time and on their own pacing (Kurt, 2017).These

videos are also helpful when studying for exam as it takes less time for revision of the topic. Videos are accessed by students at their convenient time and can re-watch the lessons till they understand the concept but in the conventional method of teaching, lectures cannot be revised (Bhagat et al., 2016).

Collaboration

Group work of students in the flipped class improves their involvement and participation in the classroom. Collaboration and shared support by other peers help in building the confidence of the students (Clark, 2015; Kurt, 2015). Working collaboratively for completing the tasks such as project-based learning activities, provide an opportunity to students to learn from their peers on a daily basis(Clark, 2015). It also provides opportunities to students to promote active learning and to interact with students via an online forum (Schwarzenberg et al., 2018).The chance to work with peers, contributes to the positive classroom environment where students share their opinions comfortably and receive constructive feedback from their peers and teacher (Kurt, 2015).The in-class Q&A session allows the students to interact with their class mates and creates learning environment in which they collaboratively find solution to the problem, find answer to the question and do laboratory work (Schwarzenberg et al., 2018).

Effect of flipped classroom activities on emotional development of students

Identification of Slow Learner

The flipped classroom model also effect emotional development of students. During flipped classroom activities slow performers are identified. Their performance can be improved by making their group with high achievers who will help and guide them in their work and understanding. It provides formative feedback and scaffolding to low achievers during face-to-face sessions by their teacher or peers (Kostaris et al., 2017).

Stress Free Learning

Sahin et al.,(2015)stated that students in flipped class room model enjoy stress free learning, as they have more freedom and flexibility to choose their preparation methods for the class. They feel no anxiety of missing lecture (Kurt, 2015),rather can re-watch the videos till the understanding of the topic, without being exposed to any external pressure or stress. Furthermore, they can ask question to their teachers or peers in face-to-face class meetings regarding their topic. Huang & Hong (2016) stated that lengthy reading texts in class put time limitation and class schedule pressure on students, but they can comprehend those reading material at home with their own pace. It was recommended that watching videos prior to class, makes learning enjoyable to students and also makes classroom environment more positive and less stressful (Kurt,2015).

Motivation and satisfaction

The student's motivation was increased during the experiment. This was evident in three articles. Motivation is a driving force behind any learning or work to be performed. As students in flipped class come to class with preparation as they have already read the content or watch videos at homes, so they practice same thing in class. This practice retains information in their long term memory and also helps in their exam. Flipped classrooms prepare students for the class and help them in better learning (Sahin et al., 2015). The results of the some experimental studies showed that students with higher motivation for preparation got higher scores in flipped classroom as compare to traditional way. Satisfaction of students with flipped classroom results in greater learning motivation, as flipped class has flexibility and variety (Bhagat et al., 2016). Well prepared students are confident in class and they are successfully engage with learning activities (Kostaris et al., 2017; Kurt, 2015).

Flipped model not only motivates students but also the teachers. Teachers enjoy teaching and are motivated when students perform in class with better preparation (Kostaris et al., 2017).

Discussion

Flipped class room model is based on different activities which play a key role in motivation and learning of the students. Pre-class activities are as important as during-class activities. The review of selected articles indicated that all the instructors in flipped class room, provided material to students in advance via internet. Short videos of 5-15 minutes were shared with them to be watched anywhere and anytime (Hew & Lo, 2018)and also helped in clarity of the main concept. The review also highlighted that the pre-class material was given in hard form/ DVD to the students who had no net connection at home. Besides video, reading material was also shared with students for in-depth comprehension. Online lectures and online discussion sessions were conducted for students. This is the limitation of this model if students don't have internet connection they can't get benefit from this model. Sirakaya and Ozdemir (2018)reported significant difference between groups (experimental and control) in terms of academic achievement, motivation and retention. However, no significant difference found in terms of self-directed learning readiness. It shows although flipped classroom model has many benefits but it can't promote self-directed learning. The flipped classroom model help in communication, collaboration, interaction and engagement of students in class but Kenna (2014) results oppose this and found flipped classroom decreases classroom interaction as in traditional class those students who were engaged in asking questions in flipped classroom they do not inquire in front of class, they note their questions and ask in personal meeting. Further it was found in same study that self-efficacy decreased in

flipped classroom. It means not all variables of social development can be increased by flipped classroom model.

The main focus of flipped idea is to provide class time for active learning. Instructor does a lot of effort to design activities for students. He keeps students engage in activities and gives immediate feedback to them. The review showed that discussion was initiated in class or short quizzes were solved by students for recalling the knowledge, attained prior to class. It could easily identify the prepared and unprepared students in class. Students were also provided with opportunities to work in group or with peers known as peer tutoring. In this way peers tutoring enhancing the knowledge as well as the application ability of the students. This is recommended by Ullah, Kaleem and Aamir (2020), that during classroom instruction, students of low academic performance may be paired with students of good performance for long sessions so that the formers are guided and tutored properly. It also helps in improving social and emotional development of students. Individual assignments were also assigned to them such as projects. The review also showed the flipped class was more effective for language learning. In Pakistan medium of instruction remain a bone of contention for educationists and parents. Teaching and learning Language need special attention specially English as it is foreign language for Pakistani and many other students where English is not mother language. It is founded by Fareed, Ashraf and Mushtaque (2019) that In Pakistani schools where teachers and students' have weak English language skills, due to which the teachers are unable to deliver their ideas effectively and students face difficulty in understanding the subject; which also hinders them to be critical. Flipped classroom can handle this issue. It can be used as effective tool for language learning. Language learning needs practice along with knowledge of its rules. Students learned the rules prior to the class and more time of class was dedicated to practice which resulted in language proficiency. This finding is not supported by Hasanah and Arifani (2018) as they concluded students can't get benefit from it as they are not familiar from autonomous learning.

The review indicates that more students favored the flipped classroom approach over traditional classroom. They performed well and got more achievement than students of traditional class. The findings are similar to the results of Uskokovic's (2018) study which demonstrated flipped class students' better performance in knowledge test as compare to performance of traditional lecturing class students. Aronson and Arfstrom's (2013) study results are parallel as students in the flipped courses cored more than the students of tradition class due to interactive learning methods.

Variation was found in the findings of the reviewed studies, as no difference was found in the achievement scores of the students of both classes. Students' attitude towards flipped classroom instruction was positive (Bhagat et al., 2016) but a few students (in some studies)favored traditional teaching because they were used to traditional teaching and were hesitant of participating in class activities and asking questions.

The review also highlighted the benefits of flipped class room model. Students were motivated and engaged in their study related activities. It showed flipped classroom help in emotional development (Cabı, 2018). The reason was their pre-class preparation which gave motivation and confidence to them. The positive response of students, students' interest in learning and participation in discussion, also motivated teachers for further and better planning.

Flipped class room approach gives more opportunities to students to interact with teacher and to other class mates. They work in groups and share their plan of action with each other. The review showed that passiveness in class leaves many questions in the mind of the students but in the flipped classroom, the teacher speaks to every student and asks questions to students which help in clarity of the concept. Many things are cleared through open communication in class.

The review showed that the main reason of the interest of students in flipped class room approach was watching "videos" which required less time and delivered more information. Students accessed these videos at per their convenience.

Conclusion and Recommendations

On the bases of literature and data analysis of selected articles it is concluded that the flipped classroom instruction ensures significant improvement in learning of the student as compare to the students who learn in traditional class. It increases academic achievement; improve social and emotional development of students. In addition, videos are so effective and less time demanding for attaining information. Flipped classroom approach is one of blended learning approach in which learning could be joyful and classroom remains less stressful. Flipped class room approach supports active learning and makes learning interesting for students. Along with the benefits there are some limitations of flipped classroom model as it requires internet connection or CD on material can be shared to students. The students need to be trained for self-directed learning, otherwise it can't benefit to them. The video content and lectures preparation is difficult task for teachers. All teachers do not have these skills, so prior training of teachers is required for material selection, material development, and material presentation. There is a possibility it can waste time

money and resources. The review of qualitative researches would explore more benefits of flipped class rooms on learning, behavior, attitude and personality of the students.

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